

more diverse than, for example, that guiding clinical practice. Nevertheless, there may be particular value in new sources of evidence relating more distant determinants, such as raising household income, to health, especially from a study that is local, straightforward, and robust. Substantial changes in income are regularly made by governments via taxation, benefits, minimum wage policies, etc, but in such a way that their effects on health cannot be evaluated reliably. This initiative would increase the consideration of potential changes in health status during deliberations about such policies.

A recent non-randomised analysis suggested that windfalls (lottery wins or inheritances) of about £50 000 were associated with moderate improvements in mental wellbeing in following years.¹¹ However, much more modest increases in income, if sustained, could lead to important health benefits.^{12 13} Reliably detecting how much and how quickly those benefits are realised ideally requires large scale, long term randomised evidence. The UK lottery provides a unique opportunity to generate such evidence, given its size, coordination, and high participation rate. If successful, the project could also be adopted elsewhere: most countries have lotteries and well over \$100bn is spent on lottery sales worldwide each year. However, the UK lottery provides the best opportunity, given its size, coordination, and high participation rate:

it could provide valuable evidence for future social policies, particularly those aiming to lift people out of poverty.

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Alcohol intake: measure for measure

It's hard to calculate how much you are drinking—but you should know

The festive season is a testing time, and those who wish to drink sensibly might use the "unit of alcohol"—a glass of wine or beer or a single measure of spirits—as a yardstick. But what is a unit, and how many is it safe to drink?

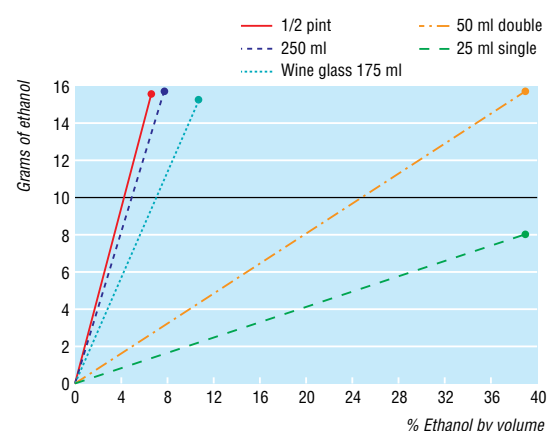
The discerning drinker could calculate the dose of ethanol in a drink knowing its volume and ethanol concentration. However, even the sober can find this difficult. Firstly, there are several ways of defining concentration. It is expressed as percentage ethanol by volume (% v/v) in Europe and as percentage proof in the United States, where 100% proof is 50% v/v (in England 100% proof was 57% v/v). The density of ethanol is 0.79 g/ml at room temperature, so, for example, 100 ml of ethanol 10% v/v contains almost 8 g of ethanol. Secondly, concentration can differ widely among apparently similar drinks. The strengths of beers range from about 3.4% to 9% v/v; white wine from 8% to 13% v/v; and spirits from 37.5% v/v for mass market vodka to 57.3% v/v for cask strength Laphroaig. Subjective impressions of alcoholic strength are fallible.¹

Establishing the volume of a drink can also be hard. In the United Kingdom a single pub measure of spirits is now 25 ml (it was 1/6th gill (1/24th pint) in England and 1/4 gill in Scotland). A half pint of beer is 284 ml. Bottles and cans of beer hold anything from 250 to 500 ml. A glass of wine in a pub contains 175 ml, but the large tulip glasses seen in fashionable restaurants contain twice that much. A small bottle of weak beer

could contain 8 g of ethanol and a large can of strong beer 35 g; a pub glass of thin Rhine wine might contain 11 g, and your host's generous glass of Pouilly Fuissé nearly 40 g. In the United States a standard drink is 12 ounces of beer, 5 ounces of wine, or 1.5 ounces of 80 proof distilled spirits (an American ounce being 29.6 ml). American and British units therefore differ substantially, which makes it hard to compare epidemiological studies.

The relation between dose and the resulting concentration in blood is also very variable. It depends on the rates of absorption and elimination and the volume of distribution (the ratio between total amount in the body and blood concentration). The volume of distribution can be estimated from age, sex, height, and weight,² but the other variables are harder to define. It is correspondingly hard to predict what dose is likely to raise the blood ethanol concentration above the statutory limit for driving (80 mg/100 ml in the United Kingdom, 50 mg/100 ml in many other countries, and 20 mg/100 ml in a few).

What effects might ethanol have? Acutely, it depresses the central nervous system and can also precipitate cardiac arrhythmia. Modest concentrations depress inhibitory neurons—turning the introvert into a garrulous exhibitionist. Higher concentrations impair cerebellar function—causing slurred speech, poor hand-eye coordination, and unsteadiness. Subsequently, sensation, consciousness, and then brainstem functions are depressed. The effects on cerebellar func-



The dose of ethanol (g) versus ethanol concentration (% by volume) for different volumes of drink

tion, seen increasingly as concentrations exceed about 35 mg/100 ml, are important. Admiral Jellicoe noted that "by careful and prolonged tests, the shooting efficiency of the men was proved to be 30% worse after the rum ration than before"³ (the rum ration was 1/8th pint—about 70 ml). The apparent effects of a given blood ethanol concentration, however, vary greatly among individuals. In some cases 500 mg/100 ml can be lethal, while in others much higher concentrations may cause few signs: a woman with a serum ethanol concentration of 1510 mg/100 ml (20 times the UK legal limit) was alert and responsive to questions.⁴

Advice to limit ethanol consumption to a specified number of units per week implies a threshold dose below which ethanol is harmless. Indeed, "the strong negative association between ischaemic heart disease deaths and ... wine consumption" in developed countries encouraged the hope that moderate drinking might be beneficial.⁵ Several prospective studies, including one of British doctors,⁶ show a J or U shaped relation between coronary heart disease mortality and ethanol

intake.⁷ Total mortality, though, increases remorselessly with intake above 12–16 g ethanol per day.⁸ Since the protective effect relates to ischaemic heart disease, those at low risk of this, including premenopausal women, may not benefit even at these levels.

So what should we do? Well, those who will be driving home, operating machinery, or operating on patients should know what they are drinking (see figure): even 10 g of ethanol will be enough to exceed statutory levels in some jurisdictions and could impair performance. One more sobering thought for Christmas: binge drinking can cause arrhythmia and sudden death⁹—or, as recently pointed out by England's chief medical officer,¹⁰ lead ultimately to cirrhosis of the liver.

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Medical oaths and declarations

A declaration marks an explicit commitment to ethical behaviour

The newly qualified doctors of Imperial College School of Medicine recently adopted a ceremony in which they declare their commitment to assume the responsibilities and obligations of the medical profession. The decision to create a declaration ceremony was widely supported by the final year students and it reflects a recent resurgence in interest in medical oaths in the United Kingdom.^{1 2}

Some 98% of American^{1 3} and nearly 50% of British medical students^{1 4} swear some kind of oath, either on entry to medical school⁵ or at graduation.⁴ One reason why oaths are more common in America may be that American children are brought up to swear their allegiance to the flag, so the concept of affirming their beliefs is less alien than to British students.

Oaths are neither a universal endeavour^{3 4} nor a legal obligation, and they cannot guarantee morality.

So why should doctors take an oath at all? In 1992 a BMA working party found that affirmation may strengthen a doctor's resolve to behave with integrity in extreme circumstances. This group recommended that "medical schools incorporate medical ethics into the core curriculum, and that all medical graduates make a commitment, by means of affirmation, to observe an ethical code."⁶ The increasing complexity of healthcare arrangements and interagency collaboration, and the need to look at rationing resources, has forced the medical profession to re-examine its core values. In view of this, and with public confidence in doctors diminishing and morale at an all time low, it is perhaps unsurprising that the concept of an entire year of newly qualified doctors freely declaring their intentions to act ethically and professionally proved popular with both staff and students at Imperial College.

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